

CLAIMS

1. A reproducing apparatus, comprising:
reproducing means for reproducing an information
signal;

equalizing means for controlling a group delay
of the information signal reproduced by said reproducing
means;

detecting means for detecting a digital signal
from the information signal reproduced by said
reproducing means; and

control means for controlling a group delay
characteristic of said equalizing means by using the
reproduced information signal to be inputted to said
detecting means and a detection result of said detecting
means.

2. A reproducing apparatus according to claim 1,
wherein said equalizing means further controls an
amplitude of the information signal reproduced by said
reproducing means, and said control means further
controls an amplitude characteristic of said equalizing
means by using the reproduced information signal to be
inputted to said detecting means and the detection result
of said detecting means.

3. A reproducing apparatus according to claim 1,
wherein said control means includes multiplying means for

multiplying the reproduced information signal to be inputted to said detecting means by the detection result of said detecting means, and an integrating means for integrating a result of multiplication of said multiplying means, and controls the group delay characteristic of said equalizing means according to an output of said integrating means.

4. A reproducing apparatus according to claim 3, wherein said multiplying means includes $2n+1$ multipliers (n being an integer not less than "2") for respectively multiplying a detection result of a predetermined sample and detection results of n samples obtained both before and after the predetermined sample, included in the detection result of said detecting means, by the reproduced information signal corresponding to the detection result of the predetermined sample, and said integrating means includes $2n+1$ integrators for respectively integrating outputs of said $2n+1$ multipliers.

5. A reproducing apparatus according to claim 4, wherein said equalizing means includes a first group delay control circuit for controlling a group delay of a first predetermined frequency band, and a second group delay control circuit for controlling a group delay of a second predetermined frequency band which is lower than the first predetermined frequency band, and said control

means controls a group delay characteristic of said first group delay control circuit according to results of integration of said integrating means of samples obtained $n/2$ samples before and after the predetermined sample, and controls a group delay characteristic of said second group delay control circuit according to results of integration of said integrating means of samples obtained n samples before and after the predetermined sample.

6. A reproducing apparatus according to claim 5, wherein said control means makes a comparison between results of integration of said integrating means of samples obtained $n/2$ samples before and after the predetermined sample, and controls the group delay characteristic of said first group delay control circuit according to a result of the comparison.

7. A reproducing apparatus according to claim 5, wherein said control means makes a comparison between results of integration of said integrating means of samples obtained n samples before and after the predetermined sample, and controls the group delay characteristic of said second group delay control circuit according to a result of the comparison.

8. A reproducing apparatus according to claim 1, wherein said equalizing means includes a first group delay equalizing circuit for controlling a group delay of

a first predetermined frequency band, and a second group delay equalizing circuit for controlling a group delay of a second predetermined frequency band which is lower than the first predetermined frequency band, and said control means controls a group delay characteristic of said first group delay equalizing circuit and a group delay characteristic of said second group delay equalizing circuit independently of each other.

9. A reproducing apparatus according to claim 8, wherein each of said first group delay equalizing circuit and said second group delay equalizing circuit includes an all-pass filter.

10. A reproducing apparatus according to claim 1, further comprising:

an A/D converter for converting, with sampling, an output of said equalizing means into a digital signal composed of a plurality of bits per sample,

wherein said detecting means includes a decoder for three-value-detecting a signal outputted from said A/D converter.

11. A reproducing apparatus according to claim 1, further comprising:

an FIR (finite impulse response) filter for filtering an output of said equalizing means,

wherein said control means further controls tap

coefficients of said FIR filter.

12. A reproducing apparatus according to claim 1, further comprising:

data detecting means for detecting a digital signal composed of one bit per sample from the reproduced information signal equalized by said equalizing means; and

signal processing means for subjecting a predetermined process to an output of said data detecting means.

13. A reproducing apparatus according to claim 12, wherein the information signal includes an image signal as coded, and said signal processing means includes decoding means for decoding the image signal.

14. A reproducing apparatus according to claim 12, wherein said data detecting means detects the digital signal composed of one bit per sample by using a Viterbi algorithm.

15. A reproducing apparatus according to claim 1, wherein the information signal is a PR4-precoded signal, and said detecting means includes a decoder for PR4-decoding the information signal equalized by said equalizing means, and detects a digital signal from the information signal outputted from said decoder.

16. A reproducing apparatus, comprising:
reproducing means for reproducing an information
signal;

equalizing means for equalizing the information
signal reproduced by said reproducing means; and

control means for controlling an equalizing
characteristic of said equalizing means, said control
means having a first mode of controlling the equalizing
characteristic by using a first control method, and a
second mode of controlling the equalizing characteristic
by using a second control method.

17. A reproducing apparatus according to claim 16,
wherein said control means changes over the first mode
and the second mode according to elapsed time.

18. A reproducing apparatus according to claim 16,
wherein said reproducing means reproduces the information
signal from a recording medium having a number of helical
tracks formed thereon, and said control means changes
over the first mode and the second mode according to the
number of reproduced tracks of the recording medium.

19. A reproducing apparatus according to claim 16,
wherein said control means includes error detecting means
for detecting any error included in the information
signal equalized by said equalizing means, and, in the
first mode, controls the equalizing characteristic

according to a detection result of said error detecting means.

20. A reproducing apparatus according to claim 16, wherein said control means, in the second mode, controls the equalizing characteristic according to information related to a waveform of the information signal equalized by said equalizing means.

21. A reproducing apparatus according to claim 16, wherein said control means includes detecting means for detecting a digital signal from the information signal outputted from said equalizing means, and, in the second mode, controls the equalizing characteristic on the basis of the information signal to be inputted to said detecting means from said equalizing means and a detection result of said detecting means.

22. A reproducing apparatus according to claim 16, further comprising:

instruction means for giving an instruction for starting a reproducing operation,

wherein said control means controls the equalizing characteristic in the second mode during a predetermined period of time from the instruction for starting the reproducing operation, and controls the equalizing characteristic in the first mode after a lapse of the predetermined period of time.

23. A reproducing apparatus, comprising:

reproducing means for reproducing an information signal;

equalizing means for equalizing the information signal reproduced by said reproducing means;

error detecting means for detecting any error included in the information signal equalized by said equalizing means; and

control means for controlling an equalizing characteristic of said equalizing means by selectively using a first control method of controlling the equalizing characteristic of said equalizing means by using a detection result of said error detecting means and a second control method of controlling the equalizing characteristic of said equalizing means without using the detection result of said error detecting means.

24. A reproducing apparatus, comprising:

reproducing means for reproducing an information signal;

equalizing means for equalizing the information signal reproduced by said reproducing means;

error detecting means for detecting any error included in the information signal equalized by said equalizing means;

signal detecting means for detecting a digital signal from the information signal reproduced by said reproducing means; and

control means for controlling an equalizing characteristic of said equalizing means, said control means having a first mode of controlling the equalizing characteristic of said equalizing means on the basis of a detection result of said error detecting means and a second mode of controlling the equalizing characteristic of said equalizing means on the basis of the information signal to be inputted to said signal detecting means and a detection result of said signal detecting means.